

Application No. 09/458,235
Reply to Office Action of February 12, 2002

transducer generating a respective second echo signal representative of a second quality image higher than the first quality;

a processor configured to generate first and second display image data corresponding to said first and second quality images; and

B1 a display configured to display a motion image of implanted bubbles as produced by application of the first drive signal, with the displayed motion image being reset by breaking of the implanted bubbles upon application of the second drive signal.

44. (Amended) An ultrasound diagnostic apparatus comprising:

B2 a transducer configured to transmit in response to a drive pulse an ultrasound signal to a human body having implanted bubbles and to generate an echo signal corresponding to an ultrasound echo from the human body;

a transmission mechanism configured to apply to said transducer repeatedly a series of first drive pulses to cause said transducer to transmit corresponding ultrasound signals to break the bubbles, wherein the first drive pulses transmission is started by a trigger signal and ended a first time period after the trigger signal;

a processor configured to generate data of plural images based on echo signals generated by said transducer in response to the series of said first drive pulses and to generate a subtraction image by subtracting between the data of plural images.

50 (Amended) An ultrasound diagnostic method comprising:

C1 a transmitter configured to transmit in response to a drive signal an ultrasound signal to a region of a human body having a shadow agent with implanted bubbles and to generate an echo signal corresponding to an ultrasound echo from the human body;

a transmit driver coupled to the transducer and configured to apply to said transducer a sequence of said drive signals having a sufficiently low first power during a first time

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period so that said transducer transmits said ultrasound signal at a first power level during said first time period to allow a substantial number of bubbles to remain in said region of said human body during said first time period and a second power during a second time period so that during said second time period said transducer transmits said ultrasound signal at a second power level to break substantially all the bubbles in said region of said human; and
displaying a motion image of the implanted bubbles flow produced by said drive signals having said sufficiently low first power, with the displayed motion image being reset by breaking of the implanted bubbles of the shadow agent upon application of ultrasound of the second power level.

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55. (Amended) An ultrasound diagnostic apparatus comprising:

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a probe configured to generate an ultrasound for application to a region of a human body having implanted bubbles therein in response to a drive signal and to repeatedly scan said region to detect an echo signal;

a driver coupled to the probe and configured to apply the drive signal to the probe;
a frequency selector coupled to the driver for providing a frequency select signal to change the frequency of the drive signal from a first frequency to a second frequency;

an image processor coupled to said probe and configured to generate image data in response to said detected echo signal; and

a memory coupled to the image processor and selectively storing the image data during a time period in which the cross section of the examining human being is scanned with the ultrasound generated upon application to the probe of the drive signal having the second frequency; and

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a display coupled to the image processor and configured to display the image data generated upon application of the drive signal of the first frequency as a motion image, with the displayed motion image being reset by breaking of the implanted bubbles upon application of ultrasound produced by the drive signal of the second frequency.

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60. (Amended) An ultrasound diagnostic apparatus comprising:

a transducer configured to transmit ultrasound to a human body having implanted bubbles, and to generate an echo signal corresponding to an ultrasound echo from the human body;

means for applying a first drive signal and then a second drive signal successively to said transducer, said first drive signal resulting in said transducer generating a respective first echo signal representative of a first quality image and said second drive signal resulting in said transducer generating a respective second echo signal representative of a second quality image higher than the first quality; and

a processor configured to generate first and second display image data corresponding to said first and second quality images, the first image data being representative of a motion image produced during application of said first drive signal, said motion image being reset by breaking of bubbles by ultrasound produced by application of the second drive signal.

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Please add new Claim 71 as follows:

71. (New) An ultrasound diagnostic method comprising:

transmitting an ultrasound signal to a region of a human body having a shadow agent with implanted bubbles so as to generate an echo signal corresponding to an ultrasound echo from the human body, including,

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transmitting said ultrasound signal at a first power level during a first time period to allow a substantial number of bubbles to remain in said region of said human body during said first time period, and

transmitting said ultrasound signal at a second power level higher than said first power level during a second time period so that during said second time period said ultrasound signal at the second power level breaks substantially all the bubbles in said region of said human; and

displaying a motion image of the implanted bubbles flow produced by said ultrasound signals transmitted at said first power level, with the displayed motion image being reset by breaking of the implanted bubbles of the shadow agent upon application of ultrasound of the second power level.

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Cont.

REMARKS

Favorable reconsideration of this application as presently amended and as amended in the amendment filed June 12, 2002 is respectfully requested.

Claims 1-45 and 47-71 are presently active in this case, Claims 29, 44, 50, 55 and 60 having been amended and Claim 71 added by the present amendment.

The above changes to Claims 29, 44, 50, 55 and 60 correct minor informalities uncovered in these claims upon review thereof by Applicant. For example, in Claim 29, penultimate line, "firsts" has been changed to --first--; in Claim 44, last line, "subfraction" has been changed to--subtraction--; in Claim 50, at line 3, antecedent basis for the recitation of "the shadow agent" stated in the last paragraph of Claim 50 has been added, and additional minor changes have been made; in Claim 55, second to third line from the bottom, the redundant recitation of "of the implanted bubbles" has been deleted; and in Claim 60, line 3, "generating" has been changed to --generate--.